

What is claimed is:

1. A motor vehicle comprising:  
  
a vehicle system power source;  
  
a controller area network;  
  
a modular power unit coupled to the controller area network to receive control signals, the modular power unit comprising signal decoding means for generating switching signals in response to the control signals and power application switches responsive to the switching signals for controlling selective translation of power from the vehicle system power source to a load;  
  
at least a first vocational controller coupled to the controller area network for communication;  
and  
  
a modular power take off manager having an operator interface and being coupled to the vocational controller for transmitting control signals for the modular power unit over the controller area network.
2. A motor vehicle as set forth in claim 1, further comprising:  
  
a vehicle system controller coupled for communication over the controller area network, the vehicle system controller being programmed to execute a load management program using the load data from the modular power unit as input data.

3. A motor vehicle as set forth in claim 2, further comprising:  
  
an engine controller coupled for communication over the controller area network;  
  
the load management program providing requests for increasing engine output from the engine controller with increases in load.
4. A motor vehicle as set forth in claim 3, further comprising:  
  
the load management program providing for load shedding when output demand exceeds predetermined limits.
5. A motor vehicle as set forth in claim 4, further comprising:  
  
an engine;  
  
the vehicle power system including a battery and a battery charging system driven by the engine;  
  
a direct current electrical power distribution system connected to the battery and to the battery charging system allowing charge to be transferred from the battery charging system to the battery and from both the battery and the battery charging system to electrical power using devices;  
  
the modular power unit being coupled to the direct current electrical power distribution system for receiving power, the modular power unit having an alternating current power outlet, the modular power unit including an inverter responsive to the switching signals for translating the direct current power to alternating current power;

means in the modular power unit for determining a load on the alternating current power outlet; and

the modular power unit including means for transmitting the load data on the controller area network.

6. A motor vehicle as set forth in claim 4, further comprising:

an engine;

the vehicle power system further comprising a modular hydraulic pump driven by the engine;  
and

the modular power unit being coupled to the modular hydraulic pump and including a plurality of valves for selectively coupling pressurized hydraulic fluid from the hydraulic pump to a load.

7. A motor vehicle as set forth in claim 4, further comprising:

an engine;

the vehicle power system further comprising an air pressurizing system driven by the engine;  
and

the modular power unit being coupled to the air pressurizing system and including a plurality of valves for selectively coupling pressurized air to a load.

8. A vehicle power take off system comprising:
- a vehicle prime mover;
  - a vehicle power system coupled to the vehicle prime mover for energization;
  - a vehicle controller area network including a engine controller node for the engine prime mover and a vehicle system controller node, the engine controller node being responsive to requests from the vehicle system controller node for changing prime mover output and the vehicle system controller node being programmed to execute a load management program; and
  - a power switching system coupled for communication over the vehicle controller area network with the vehicle system controller node, and further coupled to the vehicle power system for energization, the power switching system being under the control of a controller element which further provides for reporting loads to the vehicle system controller node.
9. A power take off system as set forth in claim 8, further comprising:
- the vehicle power system being a direct current storage, generation and distribution system;
  - the power switching system being coupled to the vehicle direct current storage, generation and distribution system for energization, and further including a derectifier, a step up transformer and an alternating current power outlet, all under the control of the controller element.

10. A vehicle power take off system as claimed in claim 9, further comprising:  
  
a plurality of alternating current power outlets;  
  
operator controls allowing selective activation of each of the plurality of alternating current power outlets.
11. A vehicle power take off system as claimed in claim 10, further comprising:  
  
an external power connection; and  
  
means for coupling the alternating current power outlets to the external power connection.
12. A vehicle power take off system as claimed in claim 11, the load management program further comprising:  
  
steps for shedding load should power demand exceed vehicle capacity to meet the power demand.
13. A vehicle power take off system as set forth in claim 8, further comprising:  
  
the vehicle power system further comprising an hydraulic pump driven by the vehicle prime mover; and  
  
the modular power unit being coupled to the hydraulic pump and including a plurality of valves for selectively coupling pressurized hydraulic fluid to a load.

14. A vehicle power take off system as set forth in claim 4, further comprising:
- the vehicle power system further comprising an air pressurizing system driven by the vehicle prime mover; and
- the modular power unit being coupled to the air pressurizing system and including a plurality of valves for selectively coupling pressurized air to a load.
15. Apparatus comprising:
- an engine;
- a battery;
- a battery charging system driven by the engine;
- a direct current electrical power distribution system connected to the battery and to the battery charging system allowing charge to be transferred from the battery charging system to the battery and to other vehicle subsystems;
- a controller area network;
- a modular power unit coupled to the direct current electrical power system for energization and to the controller area network for communications, and having a controller element for communicating over the controller area network, at least a first alternating current power outlet and means for determining load on the at least first alternating current power outlet;
- a modular power unit management interface for operator use; and

an instrumentation controller connected to the controller area network for communications with the modular power unit and providing for connection to the modular power unit management interface.

16. Apparatus as set forth in claim 15, further comprising:

a vehicle system controller coupled to the controller area network for communications, the vehicle system controller being programmed to execute a load management program responsive to measured loads on the first alternating current power outlet.

17. Apparatus as set forth in claim 16, further comprising:

the load management program including means for requesting increased engine output from the engine controller with increases in load.

18. A motor vehicle as set forth in claim 17, further comprising:

the load management program including means for shedding load when output demand exceeds a predetermined limit.

19. A fully modularized power take off system power take off system for a motor vehicle, comprising:

a power source;

a vehicle control network;

a vehicle instrument package in communication with the vehicle control network;

a modular power control unit coupled to the vehicle control network for receiving instructions and responsive thereto for translating power from the power source for application to a load; and

an interface adapted to fit a vehicle control panel and to communicate the vehicle control network through the vehicle instrument package.

20. A fully modularized power take off system as set forth in Claim 19, further comprising:

a vehicle engine; and

the power source being a power conversion device attached to the vehicle engine to be powered.

21. A fully modularized power take off system as set forth in Claim 20, further comprising:

the power conversion device being a pneumatic or hydraulic pump, which is hung from the front of an engine to be powered by a gear train from the engine.

22. A fully modularized power take off system as set forth in Claim 20, wherein the power source is a direct current electrical system and a power conversion device is provided by an electrical inverter.

23. A fully modularized power take off system as set forth in claim 22, wherein the electrical inverter is located in a battery box with a vehicle battery.